

REMARKS

In the Office Action, claims 1-24 are rejected. By the present Response, claims 1 and 16 are amended. Claim 3 is canceled. Upon entry of the amendments, claims 1-2 and 4-24 will be pending in the present patent application. Reconsideration and allowance of all pending claims are requested.

Rejections Under 35 U.S.C. §102

The Office Action summarizes claims 1-3 and 9-11 as rejected under 35 U.S.C. §102(b) as being anticipated over U.S. Patent 4,799,090, Jun-ichi Nishizawa. (hereinafter "Nishizawa"). All of the claims are believed to be patentable for the reasons summarized below.

Claim 1 and Claims Depending Therefrom

Claim 1 recites a transistor switch for a system operating at high frequencies. The transistor switch comprises a graded channel region between a source region and a drain region, the graded channel region configured for providing a low resistance to mobile negative charge carriers moving from the source region to the drain region; wherein the graded channel comprises at least two doping levels. The transistor switch further includes a gate region extending along a side wall of the graded channel. The gate region is directly in contact with a gate contact (*See*, FIG. 1)

Nishizawa fails to disclose a transistor switch including a gate region extending along a side wall of a the graded channel, the gate region being in direct contact with a gate contact.

Applicants respectfully submit that Nishizawa fails to disclose the gate region extending along the side wall of the graded channel and in direct contact the gate contact. The gate electrode of the transistor, as disclosed by Nishizawa, controls the n⁺ type region 12 and the n type region 13 which jointly constitute a current path via an insulation

film (*See*, FIG. 2, column 3 and lines 23 to 26). Nishizawa fails to disclose a gate region directly in contact with a gate contact.

Because, Nishizawa fails to disclose a transistor switch including a gate region extending along a side wall of a the graded channel, the gate region being in direct contact with a gate contact, the reference cannot support a *prima facie* case of anticipation of claim 1. Accordingly, Applicants respectfully submit that independent claim 1 and claims depending therefrom are allowable and respectfully request the Examiner to reconsider the rejection of the claims.

Rejections Under 35 U.S.C. §103

The Office Action summarizes claims 6 and 7 as rejected under 35 U.S.C. §103(a) as being unpatentable over Nishizawa. The Office Action further summarizes claims 1-9, 12-20, 23 and 24 as rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application 2003/0178672, Hatakayama et al. (hereinafter "Hatakayama") in view of U.S. Patent Application 2003/0116792, Chen et al. (hereinafter "Chen"). The Office Action also summarizes claims 10, 11, 21 and 22 as rejected under 35 U.S.C. §103(a) as being unpatentable over Hatakayama in view of Chen and further in view of U.S. Patent 5,260,227, Farb et al. (hereinafter "Farb").

Nishizawa does not teach, suggest or disclose each and every aspect of Applicants' recited invention as claimed in independent claim 1. Moreover, the secondary references do not obviate the deficiencies of Nishizawa nor does the Examiner argue that they do. Claim 6 depends directly from claim 1 and claim 7 depends indirectly from claim 1, and is allowable by virtue of such dependency, as well as for the subject matter they separately recite. Thus it is respectfully requested the rejection of claims 6 and 7 under 35 U.S.C. §103(a) be withdrawn.

Independent claims 1 and 16 and Claims Depending Therefrom

Claim 1 recites a transistor switch for a system operating at high frequencies. Claim 16 recites a static induction transistor for a system operating at high frequencies. The transistors as recited in claims 1 and 16, include a graded channel region between a source region and a drain region, the graded channel region configured for providing a low resistance to mobile negative charge carriers moving from the source region to the drain region; wherein the graded channel comprises at least two doping levels. The transistor switch further includes a gate region extending along a side wall of the graded channel. The gate region is directly in contact with a gate contact (*See*, FIG. 1).

Applicants respectfully submit that Hatekayama fails to teach, suggest or disclose, the gate region extending along the side wall of the graded channel and in direct contact with the gate contact as recited in claims 1 and 16. The high breakdown voltage semiconductor device, as disclosed by Hatekayama, includes sidewall insulating films that are disposed on the gate layers (*See*, FIG. 2, FIG. 3, and paragraph 68). In addition, Hatekayama fails to disclose a graded channel recited.

Chen fails to obviate the deficiencies in the teachings of Hatekayama. Specifically, Chen fails to disclose a graded channel region between a source region and a drain region and the gate region extending along the wall of the graded channel. Further, Chen fails to disclose a gate electrode directly in contact with the gate region. Instead, Chen teaches a MOSFET device that includes a channel region formed by two materials such as silicon and silicon germanium (*See*, FIG. 4). Chen also illustrates an insulating layer disposed between the gate electrode and the gate region. Indeed, due to the type of device taught by Chen (a MOSFET), the gate region *cannot* be in direct contact with the gate contact.

Thus, neither Hatekayama nor Chen teach, suggest or disclose the transistor switch or the static induction transistor as recited in claims 1 and 16 respectively.

Consequently, the combination of Hatekayama and Chen simply render obvious all the recitations of claims 1 and 16.

In view of the following deficiencies in the teachings of the cited art, the Examiner has failed to establish a *prima facie* case of obviousness of claim 1 and claim 16. These claims, and the claims depending therefrom are therefore believed to be clearly patentable over the cited combination. Their reconsideration and allowance are respectfully requested.


Claims 10 and 11 depend directly from claim 1, and claims 21 and 22 depend directly from claim 16. These claims are therefore allowable by virtue of such dependency, as well as for the subject matter they separately recite. Thus it is respectfully requested that the rejection of claims 10, 11, 21 and 22 under 35 U.S.C §103(a) be withdrawn.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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